Further, the cooling unit includes a depressurized airtight casing for accommodating the cooling medium therein. By way of employing the airtight casing, the boiling point of the cooling medium can be reduced.

Preferably, the substrate processing apparatus further includes a temperature sensor disposed near the sealing member and a cooling unit controller for controlling the cooling unit based on a measurement result of the temperature sensor. By using the temperature sensor and the cooling unit controller, the temperature in the vicinity of the sealing member can be maintained at a desired level.

In accordance with the present invention, there is further provided a substrate processing apparatus including: a processing chamber for accommodating a substrate therein; a mounting table having a mounting portion for mounting thereon the substrate and having a support for supporting the mounting table; a heating member disposed in the mounting portion, for heating the substrate; a sealing member disposed between the support and the processing chamber; and a shielding member for shielding a heat radiation directed toward the sealing member from the mounting table.

Preferably, the shielding member covers at least a part of a bottom surface of the mounting portion. Here, the bottom surface of the mounting portion refers to a surface opposite to a surface of the mounting portion on which a

5. The apparatus of claim 4, wherein the processing gas supply system includes a plurality of processing gas supply units for supplying different processing gases and a processing gas supply unit controller for controlling each of the processing gas supply units such that the processing gases are supplied alternately.

6. A substrate processing apparatus comprising:

a processing chamber for accommodating a substrate therein;

a mounting table having a mounting portion for mounting thereon the substrate and a support for supporting the mounting portion;

a heating member disposed in the mounting portion, for heating the substrate;

a sealing member disposed between the support and the processing chamber; and

a shielding member for shielding a heat radiation directed toward the sealing member from the mounting portion.

7. The apparatus of claim 6, wherein the shielding member covers at least a part of a bottom surface of the mounting portion.

8. The apparatus of claim 6, further comprising a